

REMARKS

The Examiner's Action dated April 22, 2004, has been received, and its contents carefully noted.

In response to the claim objections and rejection presented in sections 2 and 4 of the Action, the rejected claims have been amended in the manner suggested by the Examiner. Accordingly, it is requested that this objection and rejection be reconsidered and withdrawn.

The prior art rejection presented in section 6 of the Action is also respectfully traversed.

The present invention, as defined in claim 1, provides a manually actuated input device for commanding machine- and/or computer-assisted control operations for kinematic motions of a real or virtual multipart object. The device includes a force/moment sensor with which linear displacements having six degrees of freedom are sensed and converted into command motions of the object to be controlled. The commanded individual displacements are assigned specific kinematic motion patterns and the commanded velocities of the corresponding individual linear displacements and/or rotational excursions of the sensor are additionally weightable as a kinematic interlink assignment.

The primary reference, Armstrong, discloses a manually actuated input device with six degrees of freedom, in which commanded individual linear displacements of a sensor can be assigned to a specific kinematic motion pattern. As the Examiner acknowledges, this reference does not disclose that, in addition to displacement, velocities of the displacements can be used as additional interlink assignments.

The controller disclosed by Armstrong is identified in the reference as a relative position sensor that provides a stationary input position for the user. Specification, column 3, lines 60-65. This portion of the reference specifically states that it is an object of the invention to provide means for inputting commands while providing the advantage of a stationary input position for the user. The reference also explains, at column 2, lines 17-49, that the controller according to the subject invention is intended to move the object on the display in the direction of the hand input force against the handle. This requires that the base of the controller be stationary and have a specific orientation. The reference further points out, at column 4, lines 13-19, that a benefit of the invention is that the hand and arm of the user remain in a comfortable and rested position during operation. This portion of the reference further states:

This is in marked contrast to an absolute position sensor such as the data glove in which the operators arm becomes quickly fatigued from movement and the necessity of maintaining the users hand in an elevated position.

The secondary reference, Nitta, describes precisely the type of controller that Armstrong refers to as an absolute position device having disadvantages that the Armstrong invention seeks to avoid.

The only way in which accelerations can be sensed is by using the type of control device disclosed by Nitta. In other words, in order to give the controller of Armstrong such a capability, it would be necessary to convert that controller from a relative position device providing a stationary input position for the user to an absolute position device that is held in the user's hand and responds to unrestrained movements of the user's hand. It follows that, in order to combine the reference teachings in order to arrive at a controller that senses accelerations, it would be necessary to modify the Armstrong device in a manner that is directly contrary to the teachings of that reference.

It is by now well recognized that if modification of the device of a primary reference according to teachings of a secondary reference would destroy the device of the primary reference for its intended purpose, a rejection based on such

modification is erroneous. *Ex parte Westphalen*, 159 USPQ 507 (Bd. of App., 1967). In other words, it would be clearly contrary to the teachings of Armstrong to modify the controller disclosed therein in accordance with the teachings of Nitta in order to contain accelerometers.

Moreover, contrary to the assertions presented in support of the rejection, the Nitta reference has not been found to disclose a controller that employs velocities to provide a kinematic interlink assignment. The various occurrences of the term "speed" in the Nitta specification have been noted. It is submitted, however, that the Nitta specification consistently refers to "increased speed" and "decreased speed", which correspond to acceleration. The discussion of column 10, lines 55-67 and column 11, lines 8-11 clearly indicate that character control is effected on the basis of acceleration waveforms.

Of course, there is a clear difference between acceleration and velocity. Specifically, knowledge of the acceleration of an object provides no information as to the velocity of that object.

It is further noted that none of the systems illustrated in the drawings of Nitta includes any component that derives velocity information.

It thus follows that even if the accelerometers of Nitta were incorporated into the controller of Armstrong, and it must be emphasized that this would negate the benefits sought by Armstrong, the resulting controller would not obtain kinematic interlink assignment from commanded velocities of corresponding displacements and/or rotational excursions.

It is therefore submitted that claim 1 clearly distinguishes patentably over any appropriate combination of the teachings of the applied references, at least by its recitation that "the commanded velocities of the corresponding individual linear displacements and/or rotational excursions of the force/moment sensor are additionally weightable as a kinematic interlink assignment."

All of the other claims should be considered allowable in view of their dependencies from claim 1.

For the above reasons, the rejections presented in sections 7 and 8 of the Action are traversed. All of the rejected claims depend from claim 1 and should be considered allowable along therewith.

Accordingly, it is requested that the rejections of record be reconsidered and withdrawn, all of the pending

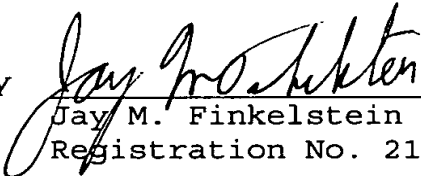
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claims be allowed and that the Application be found in  
allowable condition.

If the above amendment should not now place the  
application in condition for allowance, the Examiner is  
invited to call undersigned counsel to resolve any remaining  
issues.

Respectfully submitted,

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